

## **REMARKS/ARGUMENTS**

Claims 1-13 are pending in the application. Claims 1-7, 9 and 12-13 have been amended to more clearly describe applicants' invention. In addition, applicants have amended the specification at paragraph [0034] to recite that what they have termed the "upper" and "lower" strands are often conventionally referred to as the "top" strand and the "bottom" strand, respectively. This usage is well recognized by those of ordinary skill in this field of art. The amendments are believed to be entirely supported by the disclosure contained in the application as originally filed and thus there is no issue of new matter. Entry of the amendments is, therefore, respectfully requested. Upon such entry, claims 1-13, as amended, will be pending in the application.

## **OBJECTION TO THE TITLE**

The Office Action states, on p. 2, that the title of the application is not descriptive and that a new title is required that is clearly indicative of the invention to which the claims are directed. The Examiner suggested that the new title include "HpyC1I", i.e., the name of the restriction endonuclease of the present invention. In response, applicants have amended the title in a manner as suggested by the Examiner and such amendment is believed to overcome the objection to the title, which should, therefore, be withdrawn.

## **CLAIM REJECTIONS UNDER 35 USC §101**

Claims 1-7 and 13 are rejected under 35 USC §101 for the reasons given on p. 2 of the Office Action. In response, as suggested by the Examiner, the subject claims have been amended to add the term "isolated", which is believed to overcome the rejection. The Examiner is thus respectfully requested to reconsider and withdraw the rejection of the subject claims under §101.

## **CLAIM REJECTIONS UNDER 35 USC §112**

Claims 1-2, 4-7, 9 and 12-13 are rejected under 35 USC §112, second paragraph, as allegedly indefinite for the reasons given on pps. 2-4 of the Office Action. The rejected claims have, therefore, been amended in a manner which is calculated to overcome the grounds for

rejection.

The Office Action goes on to state that claim 5 does not further limit claim 1 and therefore it does not comply with the requirements of §112, fourth paragraph. Claims 1 and 5 have, therefore, been amended in a manner which is believed to meet all of the requirements of §112, paragraph 4.

The Office Action additionally states that claims 5 and 13 are confusing and indefinite in the recitation of “upper strand” and “lower strand”. The specification has been amended to further clarify the use of the subject terms and the claims have, therefore, been amended in a manner which, it is believed, fully clarifies the scope of the invention sought to be protected by applicants.

Claims 5 and 13 are rejected under 35 USC §112, first paragraph, for allegedly failing to comply with the enablement requirement. This rejection is respectfully traversed.

In the present invention, lambda phage DNA was digested with HpyC1I to determine the recognition and cleavage site of HpyC1I. Because the digested restriction fragment may have a sticky end, to facilitate the following ligation step, the restriction fragments are blunted by T4 DNA polymerase (see, e.g., the figure on p. 10 following) then cloned into the EcoRV site of pBR322 plasmid. The restriction fragment-vector junction was then sequenced. Both the sequences of pBR322 plasmid and lambda phage DNA are already known, the inserted fragment will be known and the restriction fragment-vector junction will also be known. Comparing the 10 junction sequences in the original lambda phage DNA (see, e.g, p. 9 following), a recognition site (5'-CCATC-3') was identified at a constant distance from the junction. When the recognition site (5'-CCATC-3') is located in the cloned HpyC1I restriction fragments, there will be 5 base pairs between the recognition site and the junction. On the other hand, if the recognition site (5'-CCATC-3') is not located in the cloned HpyC1I restriction fragments, there will be only 4 base pair between the recognition site and the junction. The foregoing comparison thus permitted the inventors to deduce that HpyC1I recognizes a sequence 5'-CCATC-3' and cleaves DNA four bases downstream from the recognition sequence in the top strand and five bases downstream from the bottom strand.

Paragraph 14 of the present specification states that “a non-palindromic recognition sequence of 5'-CCATC-3'(designated SEQ ID NO : 1) and cleaves the fourth base downstream from the recognition sequence of the upper strand and the fifth base from that of the lower strand of SEQ ID NO : 1.” Based on that point, we know that “downstream” in the specification means recognition site (5'-CCATC-3') not its inverse complement. It should be

noted that the arrow shows in the illustration on p. 9 following as the junction, not the cleavage site. Because, before being cloned into the pBR322 plasmid, the restriction fragments are blunted by T4 DNA polymerase, the junction site is not, for certain, the cleavage site. Instead, it may be off by a base more or less. There are four possible scenarios as shown on p. 10, summarized as follows:

1. Situation A (fig. 2A on p. 10): the recognition site is positioned in the cloned HpyC1I restriction fragment and existed in the coding strand of lambda DNA. In the top strand, the cleavage site is the fourth base downstream from the recognition site (CCATC). However, since the restriction fragments are blunted by T4 DNA polymerase by adding a base, the junction becomes the fifth base downstream from the recognition site, as the fourth position (4970-5009) and the sixth position (9855-9894).
2. Situation B (fig. 2B on p. 10): the recognition site is not positioned in the cloned HpyC1I restriction fragment. Instead, it existed in the coding strand of lambda DNA. In the top strand, the cleavage site is the fourth base downstream from the recognition site (CCATC) and the junction is also the fourth base downstream from the recognition site, as the first position (1325-1364), the fifth position (9581-9620) and the ninth position (39312-39351).
3. Situation C (fig. 2C on p. 10): the recognition site is positioned in the cloned HpyC1I restriction fragment. It existed in the non-coding strand of lambda DNA. In the bottom strand, the cleavage site is the fifth base downstream from the recognition site (CCATC) and the junction is also the fifth base downstream from the recognition site, as the third position (4797-4836) and the seventh position (11833-11872).
4. Situation D (fig. 2D on p. 10): the recognition site is not positioned in the cloned HpyC1I restriction fragment. It existed in the non-coding strand of lambda DNA. In the bottom strand, the cleavage site is the fifth base downstream from the recognition site (CCATC), but because the restriction fragments are blunted by T4 DNA polymerase by adding a base, the junction becomes the fourth base downstream from the recognition site, as the second position (1596-1635), the eighth position (12404-12443) and the tenth position (39588-39627).

To summarize, situation A is the same as situation C, and situation B is the same as situation D.



### cleavage site

5'-CCATCNNNNNNNN-3'  
 3'-GGTAGNNNNNNNN-5'

### first position(1325-1364)

5'-CTGGCCAAAGT **CCATC** CGTG GCTCCACGCCAAAGTGAGA-3'  
 3'-GACCGGTTTCAGGTAG **GCACC** GAGGTGCGGTTTCACTCT-5'

↓  
 junction site  
 cleavage site

### second position(1596-1635)

5'-GAAAAGACCGGGATCTGG **A** CCGT **GATGG** CATTCTCTGGT-3'  
 3'-CTTTT CTGGCCCTAGACCTG **G** GGCACTACCGTAAGAGACCA-5'

↓

### third position(4797-4836)

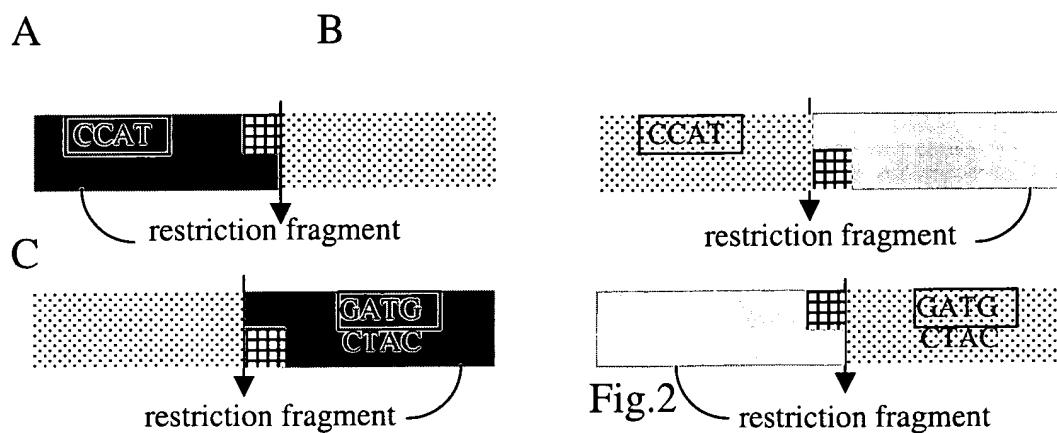
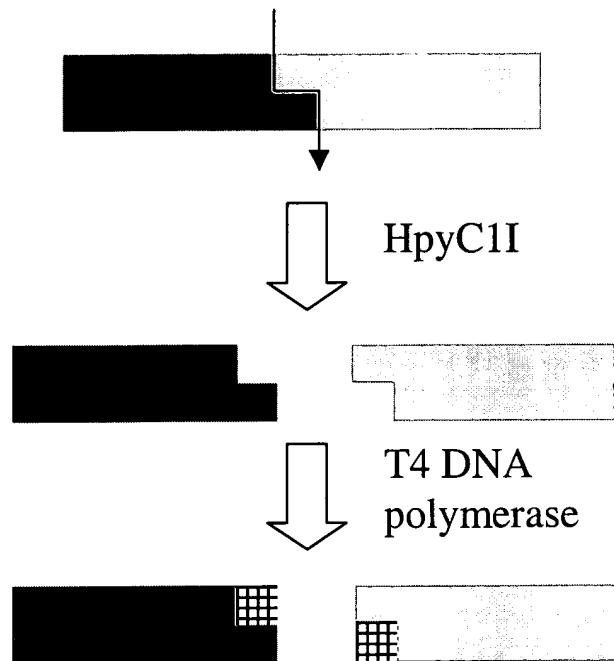
5'-TGCTCGATATGGACACGCCGGCGG **GATGG** TGGCGGGGGC-3'  
 3'-ACGAGCTATACTGTGCGGG **G** CGCCCTACCACCGCCCCCG-5'

↓

### fourth position(4970-5009)

5'-CGGACAGGGCT **CCATC** GGGC **T** CATGATGGCTCACAGTAATT-3'  
 3'-GCCTGTCCGAGGTAGCCGC **A** GTACTACCGAGTGTCAATTAA-5'

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For the reasons above, therefore, the Examiner is respectfully requested to reconsider and withdraw the §112 rejections of applicants' claims.

**SUMMARY**

The amendments and arguments provided above are believed to overcome all of the Examiner's objections and rejections regarding this application. The Examiner is, therefore, respectfully requested to reconsider and withdraw his objections and rejections so that the application may proceed to issuance.

If the Examiner believes that an interview would advance the prosecution of this case, he is respectfully invited to telephone applicants' representative at the number below so that such an interview can be arranged.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on: August 25, 2006:

Respectfully submitted,

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